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SOME NOTES UPON THE TREATMENT OF TUMOURS OF THE BLADDER.

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TO more than refer to the important and far-reaching results of the introduction of cystoscopy in the diagnosis and treatment of affections of the urinary tract would be an act of supererogation. That cystoscopy inaugurated a new era in this department of surgery is universally recognised by surgeons, and it is unnecessary to discuss the important part it has had in advancing our knowledge of tumours of the bladder. In this paper I do not propose to allude in any detail to the symptomatology of bladder tumours. It will suffice for my purpose to say that we now know (1) that tumours of the bladder are of much more common occurrence than was formerly supposed; and (2) that by cystoscopy their presence can be detected at a much earlier period than was previously possible.

In the treatment of tumours of the bladder, at least two problems have still to be solved. First, When is operation with a view to eradicate the disease justifiable? and second, In cases where complete removal of the disease is obviously impossible, at what period should we have recourse to a palliative operation? It is necessary to exclude from consideration in this connection the removal of the bladder in the effort to eradicate the disease and to limit the subject of removal of the tumour from the bladder. As a corollary to these, the question arises: What is the remote result of operative interference?

The greater number of malign as compared with benign growths has been insisted upon by Albarran, Clado and others, and in the series of cases which has been under my observation

this has been amply borne out. This makes the prognosis in bladder tumours grave, but they do not differ from tumours of other organs or viscera in remaining intrinsic for a considerable period, and it is recognised that they cause death not so much by extension of the disease to lymphatic glands or other organs as indirectly by producing renal insufficiency or by undermining the patient's health through sepsis, associated as it is, with pain, frequency of micturition and haemorrhage. It is because of this that palliative procedures are frequently so beneficial in those tumours which are so extensive when first seen that their removal is impossible. The life of the patient in such cases may be prolonged for months or even years.

If cystotomy be not used, the only means by which the site, attachment and approximate nature of a tumour can be determined is by cystoscopy, but unfortunately it is not possible in all cases to carry out a perfectly satisfactory examination, and not infrequently we are left in doubt both as regards the attachment and the extent of the tumour. This is in particular the case when the tumour is large or in those cases where there are multiple growths. Although the nature of the attachment cannot in all cases be determined, even approximately, yet so long as infiltration of the bladder wall has not occurred operation may be justifiable. In what cases are we justified in delaying operation? I think, first, in those which have extended from the prostate; and second, in those which are infiltrating epitheliomata.

The following cases illustrate each of these types:—1. Mr. R. aet. 58, was first seen by me in October, 1897. A healthy man, he had noticed, for the first time, three months before that without any cause and unassociated with any other symptom his urine was mixed with blood. The bleeding lasted 3 days and then wholly disappeared to recur however in 10 days. There were no clots, and the blood was bright red at the end of micturition: examination of the deposit revealed round nucleated cells and squamous cells, and his medical attendant suspected a tumour to be the cause of the bleeding. When I saw the patient the urine was quite clear. The prostate was not unduly large or hard and was regular in outline. Cystoscopy revealed an irregular mass, smooth on the surface attached to the prostate and extending on to the floor of the bladder.

In the belief that the tumour originated in the prostate and secondarily invaded the vesical wall, immediate operation was not advised.

AFTER PROGRESS: Occasionally during the next four years bleeding occurred, but continued to be unassociated with other symptoms (thus differing from prostatic tumours). In January 1902—4½ years from the date of the first bleeding—there was profuse haemorrhage and great frequency of micturition. His general health had not suffered and he had not lost weight. The prostate showed nothing definite, was not unduly enlarged; neither irregular nor hard. On bi-manual examination the floor of the bladder felt thickened and was much indurated. Rest in bed and medicinal treatment did not improve his condition, and on March 1902 suprapubic cystotomy was performed. An extensive tumour growing from the prostate and surrounding the urethral orifice was found. It was sessile and obviously irremovable. October, 1902. The patient has been very well up to now, but frequency of micturition has been considerable. Bleeding is not great. A tumour the size of a tangerine orange projects from the wound, and the patient is beginning to lose ground. December 1902, he died. No autopsy was permitted.

Mr. S. aet. 65. In December 1901 began to pass blood with the urine, but had no other symptoms. The bleeding continued for one month. It varied in quantity but the urine was only occasionally clear during that period. Then retention occurred and catheterisation was required on one or two occasions. For four months the bleeding was intermittent and no other symptoms developed, but four months later, when I saw him, there was great frequency of micturition and he was obviously going down hill. He had very broken nights and suffered considerable pain. The urine was alkaline and contained pus and blood. On cystoscopic examination a crateriform ulcerated surface invading the left lateral wall of the bladder was observed. Suprapubic cystotomy was performed after the patient had been told that removal was in all likelihood impossible, but that relief would be given to the pain and discomfort. The tumour was found to be just as suspected from cystoscopy. Much relief to the symptoms was got, and the patient improved greatly during some weeks, but he died four months later.

In each of these cases an operation was performed to relieve symptoms and with the view that the suprapubic wound would be permanent. In the former, operation was delayed for four years during which time the patient was able to perform his ordinary work as an engineer. I believe the tumour from the first was not removable, and the absence of any need for catheterisation and thus the avoidance of a septic cystitis enabled him to live in comfort. Operation at an earlier date would probably have done no good and would perhaps have been followed by sepsis and the production of pain and frequency of micturition,—conditions which would have caused a fatal result at an earlier period. The operation performed later when he was rapidly becoming weaker from pain and want of sleep together with absorption of toxines, gave much relief.

In the latter patient at the period when I saw him (eight months from the first bleeding, four months from the date when sepsis supervened) operation was necessitated by just those symptoms which in the former case came on very late in the disease.

Several similar cases have been under my care and it has been my invariable practice to advise delay in operation so long as the patients were able to live in comparative comfort and were not losing strength.

It is otherwise in those cases in which successful removal of the disease by operation is probable, as for instance in patients who have single tumours papillomatous in type whether they be sessile or pedunculated. Such tumours are usually implanted and do not infiltrate the muscle wall of the bladder. They may be villous papillomata or more solid growths with small villi on their surface. The former are papillomata with little stroma and with cells showing evidence of rapid proliferation, and are in my experience those most commonly met with in patients whose first symptom is haematuria of a profuse character. The latter do not bleed so freely but the intermittence of the bleeding is generally less—shorter periods of no bleeding being the rule. Indeed, the bleeding is often so continuous that the patient becomes alarmed and insists on treatment. Both of these forms are favourable for operative interference. My experience has been that while infiltrating carcinomata are much more frequently seen in patients over fifty years of age than at an earlier period in life, villous

papillomata occur in old persons as well as in those of early or middle life. In three instances of well marked pedunculated villous papillomata the patients were all over sixty years. The more solid sessile tumours and the markedly villous growths have been in the series of cases under my care almost equal in number in patients under fifty. The most common age for their occurrence is between thirty and forty.

Mr. I., aet. 35, first noticed blood in the urine in 1898. There was no cause for it and no other symptoms. The bleeding was intermittent and the blood came chiefly at the end of micturition and was then bright red in colour. No instrument was passed. Cystoscopy in November 1899 revealed a sessile tumour with stunted villi situate on the right lateral aspect of the bladder above the ureter. OPERATION: Suprapubic cystotomy was performed a day or two later. The growth was about the size of a walnut and was as seen by cystoscopy. It did not infiltrate the muscle wall, and I was able to clip it away along with the mucous membrane of the bladder and some muscle fibres. Since that date to the present time there has not been a symptom. Micros: papilloma.

Other patients with tumours similar in character have presented similar symptoms, have been treated by the same method, and have for varying periods up to this date remained well; but others, on the contrary, have had recurrence and a second operation has been needed. Two of these have many features of interest and their histories may be related.

Mr. D., 10th February, 1903. Patient aet. 33. Hematuria causeless, with no other symptom than bleeding. Cystoscopy showed multiple tumours, villous papillomata with long processes situated all around the anterior aspect of bladder wall sessile but not infiltrating. (From the age of patient I thought it possible that the tumours might be less malign than usual.) Further, that he would be able to undergo an operation of considerable length even though accompanied with much loss of blood. I advised suprapubic cystotomy. This was carried out a few days later. The tumours were large villous papillomata but implanted, not infiltrating. An endeavour was made to remove them as thoroughly as possible. There was much bleeding at the operation, but it was readily arrested by washing out with

hot water. The patient made an excellent recovery and returned home a month after operation. For nine months there was no return of bleeding, but at the end of that time there was occasional bleeding and he suffered from pain and frequency of micturition. From my knowledge of the case I advised no operative interference. The symptoms gradually got worse until twenty months after operation the frequency was so great that he got practically no sleep. There was a good deal of pain. The urine contained pus and blood and was strongly ammoniacal. He was obviously quickly losing strength and I advised suprapubic cystotomy, and performed the operation in February 1905. The bladder wall was very rigid and much thickened and over almost two-thirds of it sessile tuberculated growths were present, obviously quite impossible to remove. He made an excellent recovery. The urine became quite clear, bleeding entirely ceased, and frequency of micturition was wholly obviated by the suprapubic drainage. The condition was such that a permanent fistulous opening was indicated and this was provided for. Leakage was prevented by a special apparatus. Now, eight months since the operation, he continues well. No recurrence of bleeding or pain. He has gained weight markedly and is able to attend partially to business.

Mr., J. B., aet. 65, had for four years before he came under my care intermittent bleeding. It was suspected that the cause was a renal calculus in the right kidney, and eighteen months ago the right kidney was cut down upon, but no stone found. The bleeding continued and many clots were passed—from time to time the bladder was washed out, but without any benefit. There had been some frequency of micturition, but on the whole his one symptom was intermittent haematuria. The prostate was not unduly large. I suspected tumour of the bladder and by cystoscopy was able to see a villous growth not very large, growing from close to the urethral orifice, and extending on to the anterior aspect of the bladder wall. It was sessile and a smaller one was attached quite close to it. On bi-manual examination some thickening corresponding to the site of the tumour was detected. From the appearance I thought excision was quite possible, and I accordingly advised operation. Operation, October, 1903: Tumours found as supposed, but rather more extensive, especially

the second growth. As far as possible removed. Excellent recovery. Haematuria recurred in 9 months. Cystoscopy again used and now tumours seem to be more extensive and more intimately related to the bladder wall (micros: first tumour made up of delicate papillary processes of corium covered by several layers of more or less rounded epithelial cells). I thought so extensive that operation precluded. I advised delay in operation, and pointed out that later a palliative suprapubic cystotomy might be done. Three months later, when the frequency of pain and bleeding had so increased that his general health was suffering, I opened the bladder and found most extensive disease. Unfortunately the patient died in 48 hours from post-operative haematemesis.

The tumours in each of these were multiple and typical (naked eye and microscopically) villous papillomata. They were implanted and did not infiltrate the muscle coat, and yet in both patients recurrence or rather recrudescence and extension of the original grows occurred. The first patient, who is comparatively young is notwithstanding the recrudescence of the disease and the presence of a suprapubic fistula, at the present time not only comfortable but able to do his work. The tumours are in effect simple and if excision of the bladder were justifiable in the sense of the risk to life not being too great the disease could even yet be eradicated. It is analogous to a simple cerebral tumour situate in such a position that to operate means almost certain death. The other patient at the time of the second operation was found to have a very extensive tumour which seemed not only to have grown with great rapidity, but to have definitely begun to infiltrate the bladder wall. In this case X-ray treatment was used for a time and I believe it may have increased the rapidity of the growth of the tumour.

In these cases we may further note the actual duration of the disease. Three years in the former and four years in the latter from the time of the first bleeding. A most important question arises in such cases: Does partial removal hasten the growth? I do not think so. In the majority of cases all bleeding ceased after opening the bladder, and when the opening closed bleeding did not recur for months from the date of the operation. In one

patient eighteen months elapsed before bleeding recurred and the tumour at the second operation was much more fibrous and correspondingly less vascular than the original growth. He lived four years after the first operation.

NAEVOID TUMOURS of the bladder. Two such cases have been under my care: (1) Miss C., and (2) Mrs. W.

In both the bleeding had been extraordinarily profuse, and in both the history of haematuria was a long one. Shortly, the histories were as follows:—

Miss C., aet. 42, seen in February 1896. Five years ago without cause haematuria with clots. Retention on one occasion and catheterisation required. Bleeding intermittent. CYSTOSCOPY: Tumour size of walnut posterior to but close to the trigone. Has a thick pedicle and has phosphates over the main mass. Dilated the urethra and curetted.

In March 1898, recurrence. Suprapubic cystotomy. Tumour implanted sessile and covered with phosphates. Tumour removed and patient quite well in 1905.

Mrs. W., aet. 65, Haematuria for 12 years. No cause. Much treatment without benefit. Great anaemia. CYSTOSCOPY, January 1900. Very soft villous growth slightly raised above surface. Very localised and implanted. OPERATION. Tumour scraped away through suprapubic wound. This tumour was so soft and so little raised above the surface of the bladder it was not possible to feel it with the finger after the bladder was opened. It was just the form of tumour almost certain to be overlooked when touch was trusted to in investigating a bladder and illustrated the greater value of cystoscopy as a diagnostic agent in some cases as compared with cystotomy.

This patient remained well for three years after operation and then bleeding recurred. Cystoscopic examination showed recurrence in the form of a small extremely vascular area. Operative interference was recommended, but unfortunately the patient had a hemiplegia a month or two later and I considered operation inadvisable. She is alive at this date and haematuria, which is present, is the only urinary symptom.

The remote result of operative interference naturally varies

according to the nature of the tumour, but even in those tumours which are pathologically benign, e.g. villous papillomata, the risk of further tumour growth is considerable, however thoroughly they may seem to be excised. The patients who have been under my care have been chiefly in private practice and I have been able to trace their progress. In only three instances has a patient lived more than four years, apart from two in whom the tumour consisted almost entirely of fibrous tissue. This experience is due, I believe, to the late stage at which operation has been performed—months, and in many cases years, having been allowed to pass after the first bleeding before the operation was undertaken. Fortunately during the last three years patients have come under my care much earlier in the disease: the tumours have been smaller and the outlook after operation in these patients is much brighter.

Where the tumour has been an ulcerative epithelioma sepsis has been invariably present and in these patients death has occurred in less than six months from the date of the palliative operation. These are from the first infiltrating tumours and unless a portion of the whole thickness of the bladder wall be excised with the growth I believe operation must be necessarily futile from the curative standpoint. Unfortunately in the majority of cases of this nature excision of the part of the bladder wall invaded would be so dangerous to life as to be unjustifiable.

CONCLUSIONS. The conclusions I have arrived at from personal experience of tumours of the bladder are:—

1. In all cases of haematuria examine the bladder cystoscopically as early as possible. Symptomless haematuria is, in the majority of cases, the first symptom of vesical tumour, and early diagnosis may mean the removal of the disease at a favourable stage in its growth.

2. Pedunculated tumours are not more favourable for treatment than sessile implanted tumours of a similar nature.

3. Removal of the tumour in a certain proportion of cases can be complete, and recurrence does not take place.

4. Even if recurrence does occur the disease is delayed in its progress. The patient for a time is relieved from distressing symptoms and life is not only prolonged, but it is prolonged in greater comfort.

5. Operation should be delayed, in cases unfavourable for cure, until the symptoms are so severe that the patient's life is rendered very unpleasant and his health suffering.

6. Suprapubic drainage causes the haemorrhage to cease and by a diminution of the distressing symptoms—frequency and difficulty in micturition—makes the patient much more comfortable and prolongs life. Permanent fistulae can have apparatus so fitted that distress from leakage of urine is almost entirely obviated.

7. Operation in the later stages of the disease, when sepsis is present and the symptoms are aggravated, and the patient suffers from toxic absorption, gives great relief.

8. In all cases of vesical tumour, whether the operation be curative or palliative in its object, the suprapubic route is the best to adopt.

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THE RESULTS OF INTERNAL URETHROTOMY WITH BAZY'S MEASURING URETHROTOME, BASED ON FORTY-TWO CASES.

From the Beaujon Hospital, Paris, service of Dr. Bazy.

By DR. F. JOLY.

EVERY stricture of the urethra does not require urethrotomy, because progressive dilatation with ordinary sounds or Beniqué's bougies will often suffice in mild structures with slightly indurated walls, the sclerogenous process being still at its commencement, while the stenosis has not become definitely and irremediably formed, and likewise other strictures which, a priori, are not suspected of being dilatable.

However, many are the indications for urethrotomy, and, as has been said by Forgue, in the seventh volume of the *Traité de Chirurgie*, "it must be done when dilatation is insufficient or injurious, when one is dealing with old tight strictures, and above all those aged by tentatives at dilatation, and indurated by a badly directed treatment for an old urethritis. Under these circumstances, a dilatation is useless and still more would be injurious in the so-called irritable types, which bleed ever time a catheter is passed, producing exacerbations of urethritis and cystitis, with temporary urinary retention. And still more, urethrotomy becomes imperative when one is dealing with a urethra which is sclerous and stenosed over a large extent, when periurethral inflammatory indurations form an imminent danger from urinary abscess; when incontinence of urine shows the presence of a dilatation behind the stricture with all its train of mechanical and infectious complications, such as passive distension and sclerosis of the bladder, upon which chronic cystitis becomes grafted, and above all, ascending infection of the renal pelvis and kidney, which is made evident by cloudy polyuria, especially nocturnal, dyspeptic and general symptoms, which ordinarily terminate the evolution of affections of the lower

urinary tract, when acute infectious accidents, with repeated chills and high elevation of the temperature, do not make urethrotomy an imperative operation."

Consequently, for many years the idea of cutting urethral strictures has preoccupied the minds of surgeons and the enormous number of instruments invented is quite sufficient to indicate the important place that the operation has held in surgical therapeutics. The cutting sound of Ambroise Paré, Physic's urethrotome, invented in 1795, represent the first stage in the development of urethrotomy. In more recent years numerous instruments have been devised; some, like those invented by Arnott, MacGhie, Amussat, and Leroy d'Etiolles, are intended only to make multiple and superficial sections of the stricture; others are constructed so as to freely incise the entire thickness of the urethral walls without limiting their action to the strictured part alone.

As I am only desirous of considering instruments of recent date, it becomes necessary to establish a distinct division among urethrotomes. Some, among which Maisonneuve's instrument is the type, cut the stricture from in front backwards; others, after having passed through the strictured portion without attacking it, section it from behind forwards while withdrawing the instrument. The first of this type, invented by Ricord, Reybard and Civiale, were far too voluminous, so that the instrument could not be passed through the stricture and the operation became impossible; or the instrument passed through it with ease, and the section was consequently made in a slightly developed stricture, where dilatation alone would have been quite sufficient. To this class of instrument belongs that of Desnos, Albarran and Bazy.

Maisonneuve's urethrotome is certainly the instrument whose fortune has been the greatest and which had a decisive influence upon the destiny of urethrotomy. It had over its predecessors the enormous advantage of a metallic conductor, which was guided by a conducting bougie, thus avoiding making false passages, a thing which was always possible with those instruments which had been invented previously. The cutting blade, with its blunt apex, directed with all desired security in the groove of the conductor, should, according to the idea of its

inventor, only cut the stricture, and respect those parts of the urethra whose calibre was normal and whose mucosa was soft and non-indurated.

Performed with this instrument, urethrotomy certainly gives excellent results in the vast majority of cases, but it is, however, subject to numerous criticisms, the following being the most important: (1) Maisonneuve's urethrotome is a blind instrument, which is introduced armed and ready to functionate at any point from the meatus to the bladder, and whose action cannot be graded according to the degree of the stricture if several of various calibres are seated along the canal. In spite of the construction of the blade it cannot always pass through the healthy portions of the urethra with impunity and from autopsies made by Voillemier, and more recently by Bazy, it has been demonstrated that the urethral mucosa has been sectioned along its entire extent. This is one of the important causes of hemorrhage observed after urethrotomy with this instrument, because an incision has been made into vascular tissue, especially when the prostatic portion has been involved, while the strictured part, where sclerosis has choked up the vessels, may be slit up with impunity without giving rise to hemorrhage. (2) Since the apex of the triangular blade is blunt, this blunt part pushes the tissues before it and results in their contusion and the formation of erosions. This explains why a sensation of resistance is felt, often considerable, when a stricture is cut with this instrument. (3) And still more, although this instrument may avoid the healthy portions and only cut those points where the calibre of the urethra is reduced, it may happen that in passing it will leave a parietal fibrous band intact, and the same thing may be said of the mild type of stricture, which has been termed "*retrecissement large*" by Guyon and Albarran. From all this arises the inefficiency of this urethrotome, because, as Forgue says, in the work already alluded to, "every time that a projection is encountered in the urethra after a urethrotomy, and against which the olive point of the bougie comes in contact, and every time that a full and regular calibre has not been re-established, a recurrence should be awaited." (4) This is not all, because the necessity of withdrawing the cutting blade, after section of the

stricture, necessitates a second passage of the instrument through the same cut, and from the very shape of the apparatus, with its single groove, only allows the section of a single wall, usually the upper, or at least only the upper and lower, and here, if this is done, it is necessary to change the grooved conductor and the cutting blade. Let me add that section of the lower wall is usually useless, always dangerous, and consequently should be absolutely proscribed.

Now, since the process of cure of strictures following urethrotomy has been demonstrated, it is known that it is necessary to make as many sections as possible, multiplying the points of section in the circumference of the stricture, so that later on dilatation may be rendered more efficacious. By cutting through the entire thickness of the stricture, and even the periurethral tissues, Reybard intended to intercept a band of healthy tissue in the urethra, consequently supple tissue, in the midst of the inelastic tissues of the stricture. A manoeuvre such as this, however, was not exempt of considerable danger, and, at the present time, the end to be attained is a different one. The section does not extend beyond the thickness of the tissues composing the stricture and the re-establishment of the calibre of the canal must be obtained by only acting on the diseased tissues.

Now, what takes place in the wound of the urethral walls? During the days following the operation an inflammatory process occurs, with an intense diapedesis and a marked embryonal neoformation. At the commencement this neoformed tissue is supple and consequently can be dilated and the more there is of it in the circumference of the stricture, the more efficacious will be future dilatation, from which comes the conclusion that the more useful will be the operation the greater the number of sections made, a thing which cannot be done with Maisonneuve's instrument. (5) The impossibility of making multiple sections offers a last inconvenience, namely that in cases of tight stricture, in a very sclerous and undilatable canal, a single section of the stricture increases its lumen very slightly and when the metallic conductor is withdrawn the greatest difficulty in introducing a permanent catheter will be encountered, whose opened end will hit against and become arrested at the stricture which has been insufficiently and irregularly dilated, an obstacle that

can be avoided by resorting to multiple sections at several points of the circumference of the stricture. To sum up Maisonneuve's instrument has the great drawback of only making a single section, which is often insufficient, and of injuring the mucosa of the prostatic urethra, whose section will frequently give rise to very serious hemorrhage.

For all these reasons surgeons have been brought to substitute the blind and dangerous cutting from in front backwards, for the inoffensive and methodical section from behind forwards, as well as making multiple sections which allow very much greater dilatation without injuring the healthy structures.

The first instrument constructed with this end in view was the urethrotome of Civiale (1848), preceding a few years that of Maisonneuve (1855), and which is subject to three serious objections. If straight it can, in point of fact, section any part of the urethral wall, but it is not furnished with a conducting bougie, from which the possibility arises of making a false passage. Another objection is that by its shape it hugs poorly the curves of the canal and consequently its mere introduction is painful. Lastly it presents the serious inconvenience of being too large and from this fact it cannot be pushed through tight strictures whose lumen is less than No. 14 of Charrière's scale.

In order to obviate these defects Albarran had an apparatus constructed which presents the following advantages: (1) That of cutting from behind forwards; (2) making multiple sections; (3) a conducting bougie can be screwed on; (4) it presents a very small calibre, corresponding to No. 8 Charrière, which allows it to pass through the tightest strictures; (5) by an ingenious arrangement the instrument is supplied with a jointed blade which can be made to project to the desired height. Thanks to this arrangement one can approximately limit the effects of the blade to the strictured portions alone.

But besides these undoubted advantages, this urethrotome presents certain objectionable points. Two types have been constructed. The first is straight, useful in ordinary cases, but the introduction of which is difficult and painful, as is the case for Civiale's instrument. The second type is curved and intended especially for traumatic strictures, resulting in a lesion to the lower wall of the urethra which it can readily attack, but the curve

being adapted to the prostatic urethra, prevents rotation of the instrument in the canal and consequently the lateral, and especially the upper walls of the stricture cannot be cut. And lastly these instruments cannot be made to cut wide strictures and in order to do away with this defect, Albarran was obliged to construct a third type, the so-called dilating urethrotome, thus necessitating much complication in instrumentation. Another drawback to Albarran's urethrotome is that it must be manoeuvred altogether at once in order to cut the stricture. The cutting blade certainly comes out at the operator's will, but does not slide in a grooved conductor solidly held by an assistant, as is the case for the urethrotome of Maisonneuve or Bazy.

All the urethrotomes which I have considered present the defective point of being blind instruments to handle, or at any rate they do not exactly measure the extent of the stenosed portions which must be cut. Without any doubt, Albarran's urethrotome represents great progress by limiting the effects of the blade to the stricture alone, but it necessitates very great experience in its management. In the first place, according to the inventor's own words, one must explore the stricture with the non-cutting portion of the blade, after which by a continued and stronger pressure the stricture is cut. Consequently, great manual dexterity must of necessity play a great part in this manoeuvre, a thing which is very advantageously replaced by the measuring attachment, a capital point in Bazy's urethrotome. This instrument can be made to make all incisions that are desired and at all points in the circumference of the stricture, while it only cuts through the desired portions.

As in Maisonneuve's instrument, the blade slides in a groove, which gives all the required security in making the section, as well as all desirable precision. The instrument is constructed as follows. (Fig. 1.)

A grooved conductor which can be screwed on a conducting bougie as in Maisonneuve's instrument; this conductor is slightly curved at its end, like the beak of a slightly curved sound. The curved portion is not grooved. The instrument measures about thirty centimetres. The straight and curved portions of the instrument are separate and are united together by a joint in such a way that the curved portion remaining

immovable allows the straight part to execute movements of rotation. Now, supposing that the curved portion is introduced into the prostatic urethra with the beak directed upwards, the groove of the instrument is also directed upwards, but it can be made to turn in any position that may be desired. The blade is made to travel along the groove of the conductor.

The knife is composed of two small blades measuring about one and one-half centimetres each, and articulated in such a way that they may be placed end to end, or, on the contrary, may be made to form a more or less acute angle; from this it follows that this jointed knife, which is straight, may be given a triangular shape, and thus be made to rise more or less above the



FIG. 1

grooved conductor which directs it and consequently, according to the acuteness of the angle the incisions into the stricture will be more or less deep.

Now, in order to obtain this result the part of the instrument which carries the blade is composed essentially of two rods, one upper and one lower, the latter being a single piece. The upper one carries a compound knife at its vesical extremity, composed of two blades which are jointed together. The blade nearest the bladder articulates with the bladder end of the lower rod. Now, let it be supposed that these two rods are made to move parallel to each other, the result will be the raising up of the two blades, thus forming a more or less obtuse triangle, which will project more and more.

If the upper rod is pushed towards the bladder end of the instrument, both blades are raised and if it is drawn backwards, both blades become straight, and are hidden in the groove of the conductor.

Another instrument in every way the same as the one just

described, also has two blades, which may be raised and hidden in the same way, but instead of being sharp, the blades of this instrument are blunt and this is used for measuring the seat, the number and length of the strictures.

The measuring instrument and the cutting instrument are both furnished with an indicator which measures the height reached by the blades above the level of the grooved director. Besides this the rods carrying the blades either of the measuring or cutting urethrotome, are graduated in centimetres so that one can know exactly how far down the blades are in the urethra.

The construction of the instrument having now been explained, we will consider the manner of employing it. After having taken the ordinary antiseptic precautions the patient is anesthetized, the grooved conductor with the measuring blades is introduced into the urethra. It should be pushed down deeply so that the curved part will be situated in the prostatic urethra and in order to do this, the patient being in the dorsal decubitus, the rod is held horizontally and is then solidly held by an assistant. The measuring blades are then made to project about ten or twelve millimetres, and the instrument is drawn outwards until it becomes arrested. The point at which it becomes arrested should be noted on the graduation of the rod, in other words, how many centimetres one has been obliged to withdraw the rod. Let us suppose that this has been found to be one and one-half centimetres. The measuring blades are then pushed back in the groove and the instrument is withdrawn to the extent of eight to ten centimetres. The blades are again made to project and the instrument is pushed back toward the bladder, being arrested after following a more or less long course; the length of the instrument, which has remained outside the meatus, is then noted, let us suppose this to be nine centimetres, and by a very simple calculation ($9-11\frac{1}{2}$) the length of the stricture is given. Consequently the cutting urethrotome should incise from the one and one-half centimetres to the nine centimetres, but it is possible that between these two points there are no other strictured portions, and, in order to ascertain this, the measuring urethrotome is pushed back closed to a certain depth, and the blades are then made to project, which can or cannot be done. If they cannot be made to project it shows that one is in the

midst of the stricture and then one should try another point of the canal. If the blades can be made to project it shows that the instrument is in a healthy portion, and with the blades still projecting the instrument is moved backwards and forwards. One can then ascertain that there is a more or less considerable space of healthy urethra between the two extreme points. For instance, it may be found that the healthy portion extends from the fourth to the seventh mark. Consequently, one must incise from the one and one-half to the fourth, and from the seventh to the ninth mark. Consequently, all that is necessary is to change to the cutting urethrotome.

Three incisions are usually made in each stricture, one below and to the right, one below and to the left, and the third in the middle line above. Since at the first incision the canal is only slightly opened, the blade is made to project about six and one-half millimetres, which corresponds to No. 20 Charrière, and the incision is then made at the desired points. In order to do this the groove is turned so that it faces the right lower lateral portion of the stricture, and when the incision has been made here it is turned to the same position on the left, but here the blades are made to project about eight and one-half millimetres; and, lastly, for the third incision they are made to project at least ten millimetres. As a matter of course, the blades are returned into the groove between each incision.

As may be seen, Bazy incises much deeper than with the blade of Maisonneuve's urethrotome, which only projects to the extent of No. 23 Charrière, and nevertheless, although these incisions are deeper, and although there are three instead of one, there is always much less hemorrhage than with the Maisonneuve instrument, which in reality gives rise to very little.

The calibre of the grooved conductor is oblong, and at its greatest diameter it measures No. 11 Charrière, and at its smallest No. 9. On the other hand it is smaller than the smallest bougies of Lefort's dilator, which corresponds to No. 12 Charrière.

We will now rapidly review the cases of urethrotomy performed by Dr. Bazy, with his urethrotome, the first nineteen being taken from the Beaujon Hospital; the remainder are private cases.

CASE 1. Patient fifty-three years of age. August 7, 1900. Gonorrhoea at the age of thirty. Exploration: very tight stric-

ture. Bougie a demeure for three days. Stricture measures 2 centimetres. Sections: lower right lateral $6\frac{1}{2}$ millimetres, lower left lateral 8 millimetres, upper median 10 millimetres, sound No. 17 Charrière. Cocaine anesthesia. Consecutive dilatation.

CASE 2. Patient forty-eight years old. December 20, 1900. Gonorrhoea at 21, morning drop. Exploration: filiform bougie. Measurements: stricture 7 centimetres long. Sections: lower right lateral 6 millimetres, lower left lateral $7\frac{1}{2}$ millimetres, upper median 9 millimetres. Sound No. 16. Consecutive dilatation.

CASE 3. Patient thirty-nine years old. March 12, 1901. Gonorrhoea at twenty, gleet. Exploration: filiform bougie, stricture measures 5 centimetres. Sections: lower right lateral $6\frac{1}{2}$ millimetres, lower left lateral $8\frac{1}{2}$ millimetres, superior median 10 millimetres. Sound No. 17. Dilatation.

CASE 4. Patient forty-five years old. October 24, 1901. Gonorrhoea at twenty-five years. Exploration: bougie No. 10 passes. Stricture 5 cm. long. Sections: right lower lateral 8 mm., left lower lateral $9\frac{1}{2}$ mm., median superior $10\frac{1}{2}$ mm. Sound No. 16. Dilatation.

CASE 5. Patient twenty-nine years of age. January 12, 1901. Gonorrhoea at twenty years. Exploration: filiform bougie, stricture measures 5 cm. Sections: right lower posterior 6 mm., left lower posterior 8 mm., upper median 10 mm. Sound No. 17. December 27, bougie No. 20.

CASE 6. Patient fifty-five years of age. January 2, 1902. Three gonorrhoeas. First urethrotomy in 1884, second urethrotomy in 1886, and the third in 1886. Exploration: filiform bougie. Stricture measures 1 cm. in height, 5 cm. in length; in the middle of the stricture is a free space 1 cm. in length. Sections: right posterior 5 mm., left posterior 5 mm., superior median 8 mm.; incisions difficult to make. Open end catheter No. 14 cannot pass and a bougie No. 14 passes with friction. Dilatation up to No. 47 Beniqué.

CASE 7. Patient forty-two years of age. January 25, 1902. Two gonorrhoeas. Exploration: filiform bougie passes; stricture measures 1 cm. in length, $1\frac{1}{2}$ in height. Sections: right lower 5 mm., left lower 7 mm., superior median 9 mm. Sound No. 15 passes easily. Dilatation.

CASE 8. Patient sixty-seven years of age. January 26, 1902. Gonorrhoea in 1889. Exploration: filiform bougie passes, stricture measures from $1\frac{1}{2}$ to 7 cm. Sections: right posterior 6 mm., left posterior $7\frac{1}{2}$ mm., median superior 9 mm. Sound No. 16. February 2, bougie No. 18 passes easily. February 8 bougie No. 20, February 20 Beniqué No. 46, and March 8 Beniqué No. 48.

CASE 9. Patient twenty-nine years old. April 16, 1902. September 3, 1901, was operated on by external urethrotomy for ruptured urethra and periurethral phlegmon. Exploration: April 10, 1902, No. 10 passes. Length of stricture 1 to 9. Section: right lower $6\frac{1}{2}$ mm., left lower 8 mm., superior median 10 mm. Sound No. 15 a demeure. April 26, bougie No. 18, May 1 bougie No. 21, May 3 Beniqué No. 43, May 5 Beniqué No. 44, May 13 Beniqué No. 46, October 16 foul urine. November 6, urethrotomy for urinary infection. December 20 Beniqué No. 53.

CASE 10. Patient 45 years of age. May 16, 1902. Two or three gonorrhoeas, syphilis in 1895. Exploration: No. 12 passes, stricture measures 4 cm. Sections: right posterior $6\frac{1}{2}$ mm., left posterior 8 mm., superior median $9\frac{1}{2}$ mm. Sound No. 16. Dilatation. September 13 bougie No. 17, September 15 No. 19, October 1 Beniqué No. 43, October 8 Beniqué No. 49, October 20 Beniqué 51, July 2, 1903, Beniqué No. 49. Dilated up to No. 60.

CASE 11. Patient sixty-seven years of age, June 9, 1902. Many gonorrhoeas. Exploration: No. 12 passes; measurements show 1 to 3, $4\frac{1}{2}$ to 9. Sections: posterior right 8 mm., posterior left 9 mm., superior median 10 mm. Sound No. 16. Dilatation.

CASE 12. Patient forty-five years of age. June 16, 1902. Gonorrhoea. Exploration: filiform bougie, measurements 1 to 8. Sections: right posterior 6 mm., left posterior $8\frac{1}{2}$ mm., superior median $10\frac{1}{2}$ mm. The anterior part of the stricture is harder and tighter than its posterior part. Sound No. 16.

CASE 13. Patient fifty-two years of age. July 1, 1902. Gonorrhoea at twenty-five years of age, gleet. Exploration: No. 16 becomes engaged, filiform passes. Measurements 2 to 6. Sections: right posterior 6 mm., left posterior 8 mm., superior median $10\frac{1}{2}$ mm. Although the patient presented many varicose

veins, hardly a few drops of blood were lost. Sound No. 16. July 21 bougie No. 23, July 24 bougie No. 24, July 26 Beniqué No. 50, July 28 Beniqué No. 52, August 2 Beniqué No. 55, August 4 Beniqué No. 56.

CASE 14. Patient forty-seven years of age. July 2, 1902. Traumatic stricture. Exploration: filiform passes, length of stricture 5 cm. Sections: right posterior 7 mm., left posterior $8\frac{1}{2}$ mm., superior median $10\frac{1}{2}$ mm. Stricture harder at its anterior than its posterior portion. Sound No. 16 a demeure. Dilatation.

CASE 15. Patient fifty-three years of age. July 9, 1902. Gonorrhoea at eighteen and twenty-two years of age. Exploration: No. 10 passes, stops at the root of the scrotum where No. 6 passes. Measurements 2 to $9\frac{1}{2}$, in the middle of the stricture is a free space measuring 1 cm. Sections: right posterior 7 mm., left posterior 9 mm., superior median $10\frac{1}{2}$ mm. Sound No. 16. Dilatation. August 4 bougie No. 18, August 13 Beniqué No. 46, August 18 Beniqué No. 48, August 25 Beniqué No. 53.

CASE 16. Patient fifty-four years of age. July 26, 1902. Gonorrhoea at thirty years of age, never cured. Cystitis. Exploration: No. 9 passes. Sections: right posterior 7 mm., left posterior 9 mm., superior median $10\frac{1}{2}$ mm. Permanent catheter introduced over the conductor passes tightly through the stricture, a portion of which has not been cut. During the cutting there must have been some slight error in reading the measurements. Sound No. 14 a demeure. Dilatation. August 13 bougie No. 21, August 18 bougie No. 22. Patient was not seen again until February 2, 1903. Cloudy urine. Irrigation. Salol. Urotropin. November 23, 1903, irrigation. Salol. Urotropin. June 2, 1904, same treatment. September 1, 1904, urinary abscess in perineum. Incision, recovery.

CASE 17. Patient forty-nine years of age. October 20, 1902. Gonorrhoea at twenty-five years of age. Exploration: No. 10 passes. Measurements 1 to 9. Sections: right posterior 6 mm., left posterior 9 mm., superior median $10\frac{1}{2}$ mm. Sound No. 16 a demeure. Dilatation up to Beniqué No. 47. In 1903 dilatation up to Beniqué No. 50.

CASE 18. Patient thirty-one years of age. October 29, 1902. Gonorrhoea at twenty-one years of age. Exploration:

No. 6 passes. Measurements 1 to 6. Sections: right posterior $6\frac{1}{2}$ mm., left posterior $7\frac{1}{2}$ mm., superior median $10\frac{1}{2}$ mm. Sound No. 16 a demeure. Dilatation. November 19 bougie No. 19, November 24 Beniqué No. 42, December 14 Beniqué No. 46.

CASE 19. Patient thirty years of age. November 6, 1902. Gonorrhoea at twenty years of age. Urethrotomy at twenty-eight. Exploration: filiform bougie passes. Measurements 5 to 10 cm. Sections: right posterior 5 mm., left posterior $6\frac{1}{2}$ mm., superior median $10\frac{1}{2}$ mm. Sound a demeure. Dilatation up to Beniqué No. 46.

CASE 20. Patient sixty-three years of age. November 19, 1902. Gonorrhoea at thirty years of age, gleet persisting for several years. Exploration: bougie No. 10 is arrested in the scrotal region. Filiform passes. Measurements 1 to 8. Sections: right posterior 7 mm., left posterior 9 mm., superior median 11 mm. Sound No. 16. Dilatation.

CASE 21. Patient thirty-eight years of age. December 24, 1902. Gonorrhoea at twenty-four years of age. Exploration: No. 10 stopped at the scrotal region. Filiform passes. Measurements from $2\frac{1}{2}$ to $5\frac{1}{2}$ and from 8 to 10. Sections: right posterior 4 mm., left posterior 7 mm., superior median 11 mm. Sound No. 16 a demeure. Dilatation.

CASE 22. Patient forty-three years of age, February 16, 1903. Gonorrhoea at eighteen and at twenty-three years of age. Exploration: No. 8 passes. Measurements from 1 to 7. Sections: right posterior 7 mm., left posterior 9 mm., superior median 11 mm. Open end sound could not be passed, olive pointed No. 14 passes. Dilatation. February 24 bougie No. 18, February 26 bougie No. 20. Continued until Beniqué No. 48 reached.

CASE 23. Patient thirty years of age. May 7, 1903. Gonorrhoea at twenty years of age. Exploration: No. 12 stopped at $1\frac{1}{2}$ cm. from the meatus, No. 6 passes after a short time of arrest at the perineum. Measurements from 1 to $3\frac{1}{2}$ and at 6 from the meatus. Sections: 7 mm., $8\frac{1}{2}$ mm., and $10\frac{1}{2}$ mm. Sound No. 16 a demeure. Dilatation. On February 20 again underwent urethrotomy by Dr. Tuffier. Dilatation.

CASE 24. Patient fifty years of age, November 12, 1903.

Gonorrhoea at thirty years of age. Hematuria. Exploration: No. 18 arrested at the meatus, No. 12 at the scrotum, No. 6 passes. Measurements show a small posterior band and then a stricture measuring 1 to 5. Sections: 7 mm., 8 mm., 11 mm. Sound No. 16. November 24 bougie No. 18. Discharged November 26.

CASE 25. Patient fifty-five years of age. December 1, 1903. Many gonorrheas. Exploration: No. 17 arrested at 1 cm. from the meatus, No. 12 at the root of the scrotum, No. 8 in the deep perineal region, filiform passes. Measurements 2 to 8. Sections: 8 mm., 9 mm., and 10 mm. Sound No. 17. Dilatation the following days until Beniqué No. 45 was almost reached. May 14, 1904, cystitis, instillations. Dilatation up to No. 60 Beniqué.

CASE 26. Patient fifty-one years of age. December 16, 1903. Two gonorrhoeas. Exploration: No. 20 stopped in front of the scrotum, No. 7 stopped at the root of the scrotum, filiform passes. Measurements $1\frac{1}{2}$ to 5 and 8 to 10, the latter allowing the passage at $10\frac{1}{2}$. Sections: first stricture, 8 mm., $9\frac{1}{2}$ mm. and $11\frac{1}{2}$ mm.; second stricture, $11\frac{1}{2}$ mm., on the anterior wall alone. Sound No. 17. January 7, 1904, dilatation up to No. 41 Beniqué. January 21, urine cloudy. Nitrate of silver, irrigations, salol and milk. February 18, bloody urine. Dilatation. During 1904 dilatation resorted to several times, irrigations and salol. January 12, 1905, urine cloudy, but patient empties bladder. Urotropin. Irrigations, milk diet, nitrate of silver instillations. February 16, 1905, urinates every three hours, continues salol and irrigations.

CASE 27. Patient thirty-nine years of age. December 19, 1903. Gonorrhoea at twenty years of age, morning drop. Exploration: No. 16 arrested at the anterior perineal region, filiform passes with difficulty, allowed to remain a demeure. Measurements $1\frac{1}{2}$ to $5\frac{1}{2}$. Sections: 8 mm., $9\frac{1}{2}$ mm., and $11\frac{1}{2}$ mm. Sound No. 16 a demeure. Dilatation. Discharged December 24.

CASE 28. Patient thirty-six years of age. December 21, 1903. Gonorrhoea at twenty-two years of age, never cured. Exploration: No. 6 passes. Measurements 3 to 12. At point No. 9 the measuring instrument can be opened up to $10\frac{1}{2}$. Sec-

tions: incision $10\frac{1}{2}$ millimetres on superior wall on account of the presence of a small perineal fistula following the incision of an abscess.

CASE 29. Patient 38 years of age. February 25, 1904. Gonorrhoea at 22 years of age. Four times suffered from infiltration of urine. Forced dilatation by Dr. Routier. Exploration: No. 7 passes with difficulty. Filiform a demeure. Measurements 1 to 7. Sections: 7 mm., $9\frac{1}{2}$ mm., and 11 mm. Sound No. 17 removed on the fourth day. A cloudy fluid flows from the urethra coming from a tumefaction seated at the root of the scrotum. March 6, by pressure a few drops of cloudy liquid can still be made to flow, but the induration is much less extensive. March 14 salol and irrigations. March 24 urine purulent, salol and irrigations.

CASE 30. Patient 65 years of age. August 19, 1904. Gonorrhoea at 28 years of age. Exploration: filiform bougie a demeure. Measurements $1\frac{1}{2}$ to $5\frac{1}{2}$. Sections: 8 mm., 8 mm., and 9 mm. Sound No. 16. Dilatation. October 17 urine cloudy, instillations. Beniqué No. 51. The next higher number produces bleeding. January 9, 1905, urine cloudy, irrigation and dilatation.

CASE 31. Patient 55 years of age. October 17, 1904. Gonorrhoea with chordee, rupture of the cord. Exploration: No. 12 arrested in the scrotal region, No. 8 at the perineal region. Twisted filiform bougie passes. Measurements from 0 to 2 and from 5 to 7. Sections: 7 mm., 9 mm., and 11 mm. Open end catheter No. 17 cannot pass, being arrested at the root of the penis, sound No. 14 introduced. October 19 sound removed. October 27 dilatation, bougie No. 16, October 29 No. 18 passes.

CASE 32. Patient 40 years of age. November 5, 1904. Gonorrhoea at 23 years of age. Exploration: No. 8 passes. Measurements 2 to 11. A healthy space between 6 and 7. Sections: 7 mm., $9\frac{1}{2}$ mm. and $11\frac{1}{2}$ mm. Sound No. 16. November 20 bougie No. 21, December 6 bougie No. 23, December 26 Beniqué No. 48 and January 9 Beniqué No. 52.

CASE 33. Patient 33 years of age. November 6, 1904. Gonorrhoea at 20 years of age. Exploration: filiform bougie a demeure. When the bougie was removed the instrument could not be passed until a urethral injection of oil of vaseline had been

given. Measurements 3 to $5\frac{1}{2}$. Sections: 7 mm., 9 mm. and $11\frac{1}{2}$ mm. Open end sound No. 17 passes easily. November 20 bougie No. 20, December 5 Beniqué No. 46 and January 15 Beniqué No. 48.

CASE 34. Patient 32 years of age, November 17, 1904. Gonorrhoea 3 years ago. Exploration: No. 20 stopped just behind the meatus; No. 12 arrested at the root of the penis; No. 6 passes with friction. Measurements from 1 to 10. Sections: 7 mm., 9 mm. and $11\frac{1}{2}$ mm. The patient bled a little more than usual, because he had undergone tentatives at dilatation and had had a sound a demeure. Sound No. 16, a demeure for 48 hours. November 19 urethrorrhagia has stopped. January 16, 1905, urine clear with a few filaments. Irrigations and Beniqué up to No. 52. February 25 urine clear, two instillations a week.

CASE 35. Patient 40 years of age, November 28, 1904. Three or four gonorrhoeas. Inveterate gleet. Exploration: all the instruments are arrested in the bulbous region. Filiform bougie passes. Measurements 1 to 3. Sections: 7 mm., $9\frac{1}{2}$ mm., and $11\frac{1}{2}$ mm. Sound No. 16 passes easily. December 19 urine cloudy. Dilatation. Bougie No. 20. December 31st bougie No. 24, January 9, 1905, irrigation and massage, January 16th irrigation and massage, January 25th Beniqué and instillation.

CASE 36. Patient 52 years of age. December 3, 1904. At 28 years of age. Exploration; filiform bougie passes. Measurements 2 to 7. Sections: 8 mm., 10 mm. and 11 mm. Sound No. 18. January 10, 1905 bougie No. 19, January 24 bougie No. 20 and January 31 Beniqué No. 46.

CASE 37. Patient 61 years of age, February 2, 1905. Gonorrhoea at 18 and 23 years of age. Gleet. Exploration: bougie No. 8 arrested at the root of the scrotum. Measurements 1 to 3 and 5 to 7. Sections: 8 mm., $9\frac{1}{2}$ mm. and 12 mm. Sound No. 16. Dilatation. February 10 bougie No. 20.

CASE 38. Patient 54 years of age, February 6, 1905. Gonorrhoea at 28 years, not treated. Exploration: bougie No. 9 arrested at the scrotal region. Measurements 1 to 9, in the middle a free space of 1 centimetre. Sections: 9 mm., $10\frac{1}{2}$ mm. and $11\frac{1}{2}$ mm. Sound No. 16 passes easily. Dilatation. February 20 Beniqué No. 42.

CASE 39. Patient 57 years of age, February 13, 1905.

Gonorrhoea at 22 years of age. Exploration: bougie No. 8 passes with hard friction. Measurements 7 cm. Sections: 8 mm., 10 mm. and 12 mm. Sound No. 16.

CASE 40. Patient 60 years of age. Complete retention, bougie a demeure does not enter the bladder. Imperative internal urethrotomy. Exploration: perineal stricture 3 centimetres long. Sections: $7\frac{1}{2}$ mm., 9 mm. and 11 mm. Retention lasted fifteen days, necessitating the passage of the catheter three times daily. Recovery. Died two years later from pneumonia.

CASE 41. Patient 30 years of age. April 8, 1904. Congenital stricture. Micturates by overflow, diurnal and nocturnal incontinence. Exploration: only a filiform bougie can be passed, but on the next day a metallic bougie with a blade can be introduced which was at once replaced by the cutting bougie of Bazy's urethrotome. Measurements stricture 4 cm. long. Sections: 7 mm., 9 mm. and 11 mm. Patient seen in October. Bougie No. 20 passes easily.

CASE 42. Patient 63 years of age, June 1903. Infected, fever, retention. Imperative internal urethrotomy. Exploration: stricture 5 cm. in length. Sections: 7 mm., 9 mm. and 11 mm. Only a drop or two of blood. Recovery.

From all that has been said we may conclude that the principal reproach that may be made against the various urethrotomes in general is the impossibility or difficulty of exactly measuring the stricture and consequently the risk that one runs of cutting the healthy portions of the urethra. With Bazy's instrument one can exactly determine the seat, length, calibre and number of strictures. His urethrotome, contrary to that of Maisonneuve, will only cut the stenosed tissues and respects the healthy parts. No hemorrhage occurs, although three incisions are made, because fibrous tissue alone is cut. It allows one to introduce a sound of quite large calibre, generally No. 16 Charrière and in almost all the cases operated on the increase in calibre of the urethra obtained has been quite sufficient without any danger of recurrence.

RENAL NEOPLASMS ORIGINATING FROM ABERRANT SUPRARENAL TISSUE GERMS.

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(*Conclusion.*)

RENAL carcinoma occurs as an infiltrating tumor, which frequently gives rise to a very extensive growth, the kidney retaining its shape, while in adenosarcoma it is apt to be lobulated, but not in the same way as smaller suprarenal tumors which are at the beginning of malignant degeneration, and which appear as characteristic growths projecting above the renal parenchyma.

The differential diagnosis may be considerably aided by palpation, but which, as already mentioned, is rarely satisfactory. In the extremely rare carcinomas arising from the renal pelvis, however, which, in their further course may give rise to growths detected by palpation, symptoms of renal retention with all its results, severe attacks of pain and alternating swelling of the tumor will be in evidence.

Carcinoma of the kidney, while still small, contracts adhesions with the surrounding parts and, for this reason, gives rise to considerable difficulty in removal by nephrectomy, whereas, renal tumors of the suprarenal type are easily shelled out.

The development of renal cancer is slow and frequently only gives rise to metastases late in its progress, or they may be for a time localized in the neighboring lymphatics, although extension into the veins is occasionally met with, whereas malignant suprarenal tumors produce metastases at a very early date in their development, the distant organs becoming involved almost exclusively by way of the vascular system.

If, in a patient who is near the prime of life, an intermittent hematuria occurs and which is proven by cystoscopy to be of renal origin, and at the same time there is little or no pain and no renal retention, and if the hematuria cannot be accounted for by the presence of any other disease of the kidney, it is probable that one is dealing with the suprarenal type of growth. If to this a tumor

can be palpated which is distinctly limited from the kidney tissue the probability then becomes a certainty.

The prognosis of malignant suprarenal tumors is not favorable. They may remain for some time as benign neoplasms without endangering the life of the patient, but if they commence to give evidence of progressive growth and rupture into the blood vessels, a change which is clinically shown by the occurrence of hematuria, death will, in all probability, soon take place. It is unfortunate when the hemorrhages occur, which cause the patient to consult a physician, that it is usually too late to undertake any radical cure, especially if a certain time elapses before the diseased organ is removed by operation. Generally speaking, in five or six months after the first hematuria, metastases arise and from two to three years after the first evidence of blood in the urine the patients will die. At the same time, it is possible that during the time of the first hematuria the neoplasm is still histologically non-malignant and only later on shows anatomical evidences of malignant degeneration. Therefore, any tumor of the kidney which presents clinical evidences of the suprarenal type should be considered as an extremely malignant new growth.

The treatment naturally can only consist of nephrectomy, complete removal of the diseased organ being undertaken. Horn-born questioned whether or not in certain cases enucleation of the growths, or rather resection of the kidney might not be sufficient. But although the very sharp demarcation from the kidney tissue may render enucleation of the tumor a possibility, still, on account of the malignant character of all these growths, as radical a procedure as possible is to be recommended. Nephrectomy, at the present time, can be accomplished with quite a degree of safety, because with the present methods of renal examination an exact idea of the functional activity of the normal kidney can be obtained.

It must, however, be admitted that even a radical operation gives an unfavorable prognosis, as far as a permanent cure is concerned. Küster considers that a permanent cure has been obtained if no recurrence occurs within the first three years following the operation. According to Burkhardt's statistics based on 15 operations, 1 patient died from metastases within one year, 6 died from a recurrence varying from four weeks to almost two

years after the operation, 1 died from some other cause, and 6 were alive and well from six months to seven years afterwards.

If hemorrhages have already occurred for a considerable time before the operation is done, it is then very probable that neoplastic emboli have been carried throughout the organism and have given rise to metastases, consequently the prognosis is almost always fatal.

In our first two cases the patients had remained perfectly healthy up to the time of coming under observation, in spite of the fact that in case 2 hematuria had occurred three years before the operation. Of course, up to the date of writing, only about two to two and one half years have elapsed, so that one cannot as yet speak of a permanent cure. However, from the fact that the tumors were still comparatively small, and that during the operation no visible nor palpable metastases or tumor thrombi were discovered in the large vessels, and also from the histological examination, which showed only the beginning of proliferation and atypical tumor tissue, and in the second case from the long duration of the hematuria without metastatic formation, the conclusion may be drawn that a permanent cure has been obtained, especially since about two-thirds of the time has passed which is considered the limit for recurrence. Our third case deals with a very malignant tumor, which six weeks after the first appearance of the hematuria had given rise to a distinctly palpable tumor and evident metastases twenty-one months after nephrectomy. Death occurred comparatively late, namely, two years after the occurrence of the metastases and three years and nine months after the operation.

Opinions differ as to the method of operation, and whether or not lumbar incision or the transperitoneal route should be adopted. Billroth advised first ligating the renal vessels and then to remove the tumor, so that while the manipulation necessary for the removal of the kidney was going on, bits of the growth could not become detached and enter the blood vessels. Although removal of large renal growths through a lumbar incision can be carried out successfully, especially if it is carried forwards and downwards, still the organ with its delicate vascular tumor is pulled upon and squeezed in spite of careful handling before the hilum is reached, so that, in all probability the above mentioned

danger may take place. Examination of the vessels of kidneys removed under these circumstances very often show tumor thrombi.

From this standpoint laparotomy is much more advisable, especially as it gives the best possible opportunity for detecting metastases and adhesions, while the present methods are so perfect that there is no more danger in opening the abdominal cavity than performing the extraperitoneal method. Laparotomy is to be advised especially in doubtful cases where symptoms of a renal growth exist, but where palpation remains negative. Thus, one can ascertain the condition of both kidneys, both by sight and touch and is prevented from making a useless renal incision, as was done in our first case, where cystoscopic examination gave evidences of a left-sided renal tumor. If a growth is found adherent to the surrounding parts, rendering its removal difficult, a diagnosis of a true carcinoma of the kidney can then be made and the main object is the removal of the lymph glands in the region. However, if the growth is found to be encapsulated, especially if very extensive, one is then dealing with a suprarenal tumor and the hilum of the kidney and its vessels are to be looked out for. Laparotomy is also preferable in cases of very large tumors, which are still operable. In these cases of extensive adhesions and metastases, it is quite permissible to discontinue the operation without trying to remove the tumor so as not to subject the patient to the dangers of an extremely difficult and incomplete operation.

The approximate mortality of operation for suprarenal growths has been placed by Wendel at 50% and he attributes this unfavorable condition of affairs to the fact that in many of the cases the time within which a safe operation could have been undertaken had been exceeded. Out of 24 cases who survived the operation, 5 patients died in the course of five months to three years and four months from recurrences or metastases, making 21%; in the remaining cases cures were observed varying in length from seven months to six years. Israel has done nephrectomy for malignant suprarenal growths in 17 cases with four deaths from operation which were caused partly by severe anemia, while 5 others died from metastases. Once he operated a second time in a case of recurrence in the cicatrix; 7 of the patients operated

on lived, 4 of whom were well two years after the operation, while 5 were living five years after.

How greatly the results of extirpation of the kidney in malignant tumors have improved, is shown by the statistics of Chévalier and Heresco. The former authority compared all cases which had been published up to the year 1890 and found a mortality of 62.6%; and those reported from 1890 to 1899 showed a mortality of only 19.33%. Israel's statistics of nephrectomy up to the year 1896 showed a mortality of only 12.5%.

CASE 1. T. O., 50 years of age, admitted June 24th, 1902, discharged October 4th, 1902. In 1888 the patient had typhoid fever and since then has never been ill. On April 29, 1902, at four o'clock in the morning after a quiet sleep, the patient had a sudden desire to micturate, passing dark red urine without any difficulty, with the exception of having experienced shortly before a slight dragging sensation in the right renal region. There were no radiating pains from the kidney to the bladder. The hematuria lasted for three days, during which time the urine gradually became clearer. At the beginning of June, after palpation of the right kidney had been practiced, blood was again voided with the urine, but this did not last long. Similar hemorrhages were repeated on the 19th, 20th and 21st of June. Pain was never complained of. Occasionally small fibrinous looking particles were passed with the urine, which microscopically were found to be composed of fibrin. Many leucocytes were enclosed within the fibrin meshes. Latterly the patient has lost much weight.

On examination, when the patient entered the hospital on June 24th, we found a strong, well nourished man, the thoracic viscera being normal. The abdomen is not distended, is soft and nowhere tender on pressure. No enlargement of the liver or spleen. The kidneys cannot be distinctly palpated. The urine has an acid reaction, is clear and contains neither albumen nor sugar and even by the use of the centrifugal machine no sediment can be obtained. On the next day cystoscopy showed that the vesical mucous membrane was normal, but the ureteral orifices could not be found. On June 27th, the urine was slightly cloudy but by centrifugalization no macroscopic sediment could be recognized. In every preparation the microscope showed numerous red blood cells equally distributed. No albumen. The freezing

point of the urine was 1.01°. At twenty minutes past four in the afternoon an injection of 0.005 g. of phloridizin was given and in half an hour the urine contained 0.5% sugar and twenty minutes past six, both qualitatively and quantitatively, no sugar could be found.

On July 1st, under narcosis, the lower extremity of the right kidney could be felt, but the lower pole of the left gland could not be detected. July 4. After renewed hemorrhage cystoscopy was again tried with the following results: the right side of the bladder was perfectly free, on the left there were blood clots, which could not be completely removed by irrigation. The clots were elongated and, after removal of the catheter, no free blood made its exit from the nozzle.

July 8. At four o'clock in the morning there was another hemorrhage without any pain, as in the previous one. Cystoscopic examination showed that the bladder was free from blood. At the top of the organ was seen an ulcer the size of a linseed, with injected edges and a grayish colored base. The examination strengthened the suspicion that the hemorrhages were renal in origin, but which kidney was the seat of the trouble still remained unsettled. However, according to the cystoscopic examination it was more probably the left.

On July 14th morphine-chloroform narcosis. Patient on right side. Incision made from the twelfth rib to the iliac crest and carried anteriorly parallel with the crista. The quadratus lumborum having been exposed was clamped. The kidney was peeled out of its capsule with difficulty on account of adhesions existing between its fatty capsule and the capsula fibrosa. The adhesions appeared to be edematous. Upon exposure of both poles of the kidney the organ was not found enlarged and its surface was smooth. Only at one spot there existed a yellow node about the size of a split pea in the kidney substance. At the poles the kidney felt softer than in the middle. No tumor could be felt. The renal pelvis was free. A diagnostic incision of the kidney was made showing that the renal parenchyma was unchanged. The kidney was closed with deep catgut sutures. The wound was packed and the skin closed with three silk sutures.

July 15. Urine still somewhat bloody and in the sediment many casts, erythrocytes and a few epithelial cells were found.

August 4. Convalescence has been uninterrupted, the urine is clear and contains little sediment. On the 12th the patient was allowed to get up. On the morning of the next day the urine was again dark-colored and the supposition that it contained blood was verified by microscopic examination. In the preparations small bacteria are found, some of which show active motion.

August 17. Urine is somewhat cloudy, contains a few casts, erythrocytes and particles of tissue. The right kidney cannot be felt, but the left one can distinctly and is somewhat tender on pressure. On the next day the patient returned home, but on August 19th, during the night, there was a severe hemorrhage with pain in the right renal region. The pain which was not cramp-like, lasted all night; at the same time there was a desire to micturate, but the patient did not pass any urine until a blood clot had been voided by the urethra, after which a large amount of bloody urine was expelled. The patient then returned to the hospital and in the afternoon the urine was again perfectly clear. By the cystoscope, a blood clot was found hanging out of the right ureteral orifice. Towards evening a vermiform clot, about $2\frac{1}{2}$ centimetres in length was passed, the urine, however, being clear. Shortly afterward the patient complained of pain in the right side which extended downward from the renal region.

On August 20th the morning urine was again bloody, while on the 28th there had been no more hemorrhages and operation was decided upon. Morphine-chloroform narcosis. Patient on left side. Incision from the twelfth rib toward the iliac crest and carried parallel to the latter forwards. After separation of the soft parts the fatty capsule of the right kidney was exposed. The organ was peeled out of the fatty tissue, which was more firmly attached than normal to the fibrous capsule. Exposure of the upper pole was especially difficult. At the hilum, the ureter, renal artery and vein were ligated separately. After removal of the kidney the fat capsule was almost entirely removed. The wound was packed with gauze and an aseptic dressing applied.

On the next day the patient voided 600 cm. of clear urine, feels perfectly well and has no uremic symptoms.

September 6. The wound discharges fairly well. The total amount of twenty-four hours urine reached 1500cc., being clear, golden yellow in color and free from albumen.

October 4th. The urine is free from albumen and contains no pathologic elements, so that the patient was discharged. Two years after the operation he was still perfectly well.

PATHOLOGICAL REPORT. The removed kidney measured 12.5 cm. in length and 5 cm. in width. On the anterior surface of the organ, almost at its middle, an irregular semi-circular growth is found extending to the hilum, whose greatest diameter is 4 cm. and its highest point above the surface of the kidney $2\frac{1}{2}$ cm. The neoplasm lies under the fibrous capsule which can be easily peeled off from it and the renal parenchyma. The growth consists of single nodules varying in size from a pea to a cherry, is soft and yellowish brown in color. On section, a fibrous capsule is distinctly seen separating it from the kidney tissue but the growth extends in the form of a yellowish red nodule, about the size of a hazelnut into the renal pelvis. The central portion, especially, gives evidence of extensive hemorrhage, is soft and brittle, while its peripheral parts are also soft, yellow in color and project above the cut surface. Macroscopically the surrounding renal tissue shows no change.

Microscopic examination of the tumor showed that it was separated from the renal tissue by a distinct capsule, from which firm outshoots are interwoven, which give it an irregular appearance. At some points this capsule is very thin, at others quite thick. At one point the capsule was wanting and here the neoplastic cells appear to penetrate directly into the kidney tissue in little clusters. In the tissue layers of the capsule, collections of pigment are found as well as débris of the urinary tubules and glomeruli, the latter, however, being only in the peripheral layers. The neighboring renal parenchyma shows the presence of increased interstitial tissue, the glomeruli and urinary canals appear compressed. The remaining kidney tissue shows no pathologic change. From the fibrous capsule, an irregular network of the finest capillaries pass through the growth, upon and between which the true neoplastic cells are situated in groups and convolutions. These have a light, large, partly cubic and partly polygonal protoplasmic body, the nucleus is large and shaped like a vesicle, usually without any distinct nucleoli and almost without exception the cells contain cavities making them look hollow and light. When fresh, these cavities were found filled with fat.

In structure and arrangement the cells resemble those of the cortex of the suprarenal body, only they are larger and more distinct.

No true stroma can be found, but possibly a few fine tissue fibres accompany the capillaries from the capsule, but these can only be traced for a short distance. Stroma is lacking in the centre of the tumor and here the cells are placed directly upon the endothelium of the capillaries. Here, also, in the older portions of the growth, the capillary network becomes wider, the tumor cells form large clusters and present the most varied and grotesque shapes. In some the protoplasm is degenerated, so that only the nucleus remains, and which in places is found to have undergone granular degeneration. In those parts where the destructive process has been more extensive cavities are formed, some of which are filled with severe hemorrhages. The renal vessels are free from tumor thrombi, while the lymphnodes removed at the operation show no malignant transformation.

Anatomical diagnosis: malignant renal tumor of the suprarenal type, arising from one of the aberrant suprarenal body germs in the cortex of the kidney.

CASE 2. R. W., 48 years of age, admitted September 11, 1902, discharged October 24, 1902. In 1899, the patient, who had always been well, suddenly became ill with cramp-like pains in the right side, which extended from the renal region down towards the bladder. Shortly after this he voided pure blood by the urethra, which afterwards was mixed with urine. In three days the urine was again clear. After this attack a period followed during which he was absolutely free from symptoms, this being for about nine months. After this, the patient again noticed blood mixed with the urine for several days; four weeks later a hemorrhage again occurred. Almost every two weeks for one year the patient bleeds very profusely. Usually the hematuria arises during difficult defecation or coughing. Four weeks ago at the time cystoscopy was done and since then almost daily, he has voided blood. The patient says that suddenly after having voided perfectly clear urine there is some difficulty in micturition, whereupon urine containing clots is passed and after that pure blood. Before the hemorrhage commences he experiences pain in the loins on the right side extending from the kidney to

the bladder. Frequently the patient was surprised to be awakened from his sleep by the occurrence of a hemorrhage.

When admitted the patient appeared strongly built and well nourished. The integuments and mucous membranes, however, are pale. The examination of the thorax negative. The abdominal walls are firm and very fat, but at no point does pressure elicit pain. By bi-manual palpation the kidneys cannot be felt through the fat abdominal walls. Urine clear, free from albumen and sugar.

On September 16th a severe hemorrhage occurred upon the occasion of the patient leaving his bed. This attack was preceded by dragging pains, which radiated from the right renal region down to the bladder. Clear urine was at first passed, then retention took place with severe incontinence, until a blood clot was passed by the urethra and then blood colored urine was voided. On the next day at noon the urine was still quite bloody, but at five o'clock in the afternoon, it again became clear.

Cystoscopic examination. On the right side of the bladder a vermiform blood clot could be seen, which from time to time rhythmically moved towards the right and then back again as though it were attached. After a while the anterior portion of it became released; the clot then looked like a button, and after a certain time it became vermiform in shape. In front it was thickened and bossed, showing several notches. It moved again back and forth. On the left side the papilla of the ureter could be seen as an elevation with a depression; on the right the elevation of the papilla could also be recognized, but where the depression ought to be found was the blood clot.

The urine was found free from albumen and sugar, its freezing point being 0.75° . The subcutaneous injection of phloridzin, 0.005 g. given at 11 o'clock in the forenoon showed a half an hour later 0.6% of sugar in the urine; at noon there was 3%, at 12.30 P. M. there was still a trace, while at 1 P. M. and 1.30 P. M. the sugar reaction had disappeared.

September 19. Three vermiform blood clots were passed in the morning in clear urine; these measured respectively 2, 5 and 7 cm. in length. No new attack of hematuria. September 20. During the night the patient experienced from time to time pain in the right side radiating from the renal region toward the

bladder. At about 5 A. M. a clot was passed in clear urine immediately after the patient had been to stool, after which some liquid blood was voided by the urethra. Cystoscopic examination distinctly showed hemorrhage from the right kidney, due probably to a malignant neoplasm of the organ.

September 22. Morphine-chloroform narcosis. Left-sided position. Incision carried from the twelfth rib downward toward the iliac crest and parallel to the latter forwards. The abdominal muscles were in part separated, the quadratus lumborum clamped, after which the fat capsule was split. In shelling out the kidney the albuginea was torn and parts remained attached to the fat capsule. Exposure of the upper renal pole was difficult, but was finally accomplished without resection of the twelfth rib. At the upper pole a very soft neoplasm was found, which was torn during the operation and bled profusely. After the kidney had been freely exposed the organ was twisted out of the wound and the vessels and ureter were ligated separately. After removal of the kidney the fat capsule was extirpated and the wound packed with gauze.

September 23. The patient passed 700 cc. of bloody urine during the night and in the morning 200 cc. of clear urine. The next day the urine remained clear, but the patient complained of nausea and vomited once towards evening.

September 26. Vomiting did not recur. The total amount of urine in twenty-four hours was 1950 cc. The patient complains of little pain. Moderate secretion from the wound; the region of the wound was not red nor swollen. The gauze commenced to loosen up. On the next day the gauze had become loose. The wound was still covered with a grayish coating, but here and there patches of red granulation tissue were appearing. Wound secretion was still profuse, but the urine was clear and free from albumen. Gauze packing changed. October 10. The wound granulating well, so that on October 24th the patient was discharged with a small fistula, which, during the next three months, gave exit to a few of the buried sutures. Two years after the operation the patient was still well.

PATHOLOGICAL EXAMINATION. The length of the kidney was 12 cm. and 6 cm. in breadth. In the centre of its convexity was found a semi-circular growth projecting about $2\frac{1}{2}$ centimetres

above the level of the organ and which extends equally on both sides over half the breadth of the kidney. The fibrous capsule covered it and could easily be peeled off. The growth had a yellowish brown color. On section it was found that the neoplasm was completely encapsulated and composed of several rounded masses varying in size from a pea to a cherry. The neoplastic tissue was soft, light yellow in color and projected above the cut surface. In the larger and older nodules, extensive and old hemorrhages were detected. The growth extended into the renal pelvis and almost filled it and here it was of a bright red color, distinctly showing fresh hemorrhages on the surface. The free portion of the renal pelvis contained many blood clots. Macroscopically the renal tissue showed no change, the blood vessels were empty, while in the perirenal fat no neoplastic formations could be seen.

Microscopic examination. The tumor was distinctly separated from the renal tissue by a thick and tough fibrous capsule from which broad fibrous offshoots penetrated the neoplastic tissue, dividing it up into nodules. The inner layers of the capsule are in general less rich in cells than the outer ones, the latter showing isolated groups of round cells and also some scanty remains of the glomeruli and urinary canals. Here and there some pigment granules were found. The capsule can be recognized in all sections made of the tumor, although in various degrees. Penetration of the neoplastic tissue into the kidney parenchyma can nowhere be seen. The renal tissue itself only shows an increase of interstitial tissue in the neighborhood of the tumor, otherwise there were no pathologic changes.

The neoplastic tissue consisted of a network of capillaries forming large and small meshes, filled with tumor cells. No stroma could be discovered, the cells in the neighborhood of the capillaries being placed directly upon the capillary epithelium, while the remaining tumor cells lie directly beside each other. Their arrangement around the capillaries was in rows; in the centre of the meshes they lie together in little clusters. The cells are polygonal and square, while especially in the more recent portions at the edge of the growth they are sharply defined; in size they are larger than the cells of the borders of the suprarenal capsule, which they otherwise resemble. The nuclei are

large and generally show the presence of nucleoli. The protoplasm is very light and glossy and contains vacuoli representing the remains of fat infiltration, from which the cells take on a vesicle-like appearance. In the central portions of the growth extensive hemorrhages were observed with necrosis arising around them, and also in the border regions the centres of the capillary meshes were frequently found replaced by hemorrhages, while only the marginal tumor cells remained. In some of these spots the blood has disappeared, giving rise to the development of a gland-like structure.

The renal vessels were found free from tumor cells and the extirpated lymphnodes contained no metastases.

Anatomical diagnosis: malignant neoplasm of the kidney of the suprarenal tissue type, originating from aberrant suprarenal capsule germs.

CASE 3. Female, forty-one years of age, admitted June 1, 1896, discharged July 17, 1896. Ten years ago the patient had a severe and painful intestinal affection, and was confined in bed for ten days. For the past fifteen years she suffered with chronic constipation, which was generally overcome by enemas. For the past year the patient has suffered considerably from headache, especially in the back of the head. For the last six months she has been losing weight. Three months ago the urine was red in color for several days. About six weeks ago the patient noticed a movable tumor on the right side of the abdomen which was not painful on pressure, and of late had grown larger. Just after Christmas, 1895, she had an attack of vomiting consisting of bile.

Upon admission the patient was a medium sized, slender and healthy looking woman. Nothing in the heart and lungs. The abdomen was soft, not distended, and the liver not enlarged. On the right side a tumor the size of a fist can be detected when the patient is lying down, with its upper end disappearing up behind the liver, over which a tympanitic percussion sound can be elicited. The tumor is slightly movable and can be pushed down as far as the anterior superior iliac spine, so that its upper pole can be grasped. The length of the growth was estimated to be about 11 cm. It was not tender on pressure. When the patient lies on the left side, the tumor drops slightly to the left.

June 3. In the evening the patient complained of a severe pain in the right renal region of an intermittent character, which lasted until the evening of the following day and was accompanied with nausea and the vomiting of bile upon several occasions. On the afternoon of the previous day the urine was dark red and microscopically was found to contain blood. The next day, however, there were only traces of blood and in the evening it was again perfectly clear.

June 5. In the morning the urine was very dark red, at noon it was again clear. On the previous night the patient complained of severe colicky pains in the bladder, which lasted for an hour and a half. On the next day the urine was clear and free from blood. When centrifuged flattened epithelium was found along with a few hyalin casts. Cystoscopy showed no changes in the fundus or neck of the bladder. The patient complained much of headache and a heavy feeling in the head, but presents no urinary symptoms. The examination led to the diagnosis of a malignant tumor of the right kidney.

June 17. Morphine-chlorform narcosis. Incision carried along the external border of the right rectus commencing at the ribs and carried nearly to the inguinal region. When the abdomen was opened the intestines were pushed towards the median line. Incision of the peritoneum covering the kidney. The organ was then shelled out and partial removal of the fat capsule was accomplished. Numerous vessels in the capsule had to be ligated. The vessels and ureter were ligated separately. The stump was buried and the cavity left was packed with iodoform gauze, the abdominal wound sutured except that part which gave exit to the gauze packing.

June 18. 700 cc. of dark brown urine was drawn by catheter which was found free from albumen and blood. For some days the urine was withdrawn by catheter, at first slightly cloudy, but soon became clear. In the sediment were found a few leucocytes, but no casts nor renal epithelium. The reaction was always acid.

June 26. Gauze packing changed and sutures removed.

July 17. Wound completely healed. Patient still complains of a sensation of pressure in the bladder during micturition. She was discharged.

Six months later pains recurred in the left hip and thigh and knee. At Easter, 1898, the patient entered another hospital where a neoplasm in the left gluteal region was diagnosticated and which increased in size. The patient became rapidly emaciated. Later on a swelling in the condyles of the left femur was detected, as well as some irregular growths in the left side of the abdomen and on June 7, 1900, in other words three years and nine months after the operation, the patient died from metastases.

Unfortunately the macroscopic preparation was not saved so that I had at my disposal only a few notes. It may, however, be said that the kidney exhibited at its upper pole a grayish yellow, bossed and encapsulated growth the size of a hen's egg, which extended to the renal pelvis. In the latter, evidences of a hemorrhagic catarrhal process were seen. The renal parenchyma had undergone no change.

Microscopic examination. Sections made from the borders of the growth showed that the neoplasm was completely walled off from the renal tissue by a fairly thick capsule. In this capsule scanty remains of atrophied glomeruli and urinary canals were seen in a few preparations. A narrow zone of the attached renal parenchyma showed the presence of increased interstitial tissue, but otherwise presented no changes, especially no inflammatory ones. From the fibrous capsule, narrow strands of tissue extend into the neoplasm, dividing it up into separate sections. These septums showed the lumen of vessels and a few cell nuclei. The stroma consisted almost exclusively of capillaries and only in the vicinity of the tissue septi could a few separate bands of tissue be recognized, accompanying the capillaries for a short distance. The latter were mostly arranged in meshes placed lengthwise while at other places, however, they formed a dense network with somewhat rounded or square meshes. The capillaries were more or less filled with blood, but at many points their walls were collapsed. Hemorrhages were scanty and were only found in the centre and older portions of the growth. The tumor cells were large, square and oval and larger than normal suprarenal capsule cells, which they otherwise resemble. Their nuclei were large, easily stained and supplied with a distinct nucleolus. Mitoses could only be found at a few spots at the borders of the growth. The protoplasm appeared very light, finely studded and con-

tained regular vacuolae, representing the remains of fat infiltration. As a result of this the cells looked exactly like vesicles. They were distinctly separated from each other and no intermediate substance could be found. They were mostly arranged in rows, especially in the more recent portions of the growth and resembled in every respect the arrangement of the cells of the zona fasciculata of the suprarenal capsule. The cells were arranged perpendicularly to the capillary epithelium. These rows of cells come in contact with each other, principally at the sides opposite the capillaries, but often also one or even more rows of cells were wedged in between them and which did not present such a regularly perpendicular arrangement to the capillaries. These pictures form the transition to the cluster arrangement of the tumor cells in the older central portions of the growth, while the rounded meshes of the capillary network were filled with clusters of tumor cells arranged irregularly together. But here also the cells were placed directly upon the capillary epithelium without any stroma layer. Retrogressive metamorphoses can only be recognized in the central portions of the growth in the neighborhood of the small hemorrhages, in the form of circumscribed necroses.

Anatomical diagnosis: renal tumor of the suprarenal capsule type with commencing malignant transformation, originating from the aberrant germs of the suprarenal capsule.

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EDITORIAL.

SARCOMA OF THE PROSTATE.

SARCOMA of the prostate is a very infrequent affection and hardly more than forty cases have been so far recorded, while, out of this total, only 27 of them were submitted to a microscopical control. The disease is extremely serious, the duration varying from a few weeks to a few months. It may be met with at any age, but is more common in infancy and youth. Thus, for example, 3 cases are reported occurring in subjects from 8 months to one year of age, 8 instances between $1\frac{1}{2}$ years and 10 years, 3 cases occurring between the tenth and the twelfth year, 6 from the twenty-first to the thirty-fifth year and 7 after fifty years of age. Surgery is powerless and all operative interferences have been regularly unsuccessful. The simplest and most rational treatment is to allow the affection to continue its progress.

In a recent clinical lecture (Journal des Practiciens, September 16, 1905) Guyon relates the case of a young man 19 years of age who entered the hospital for a retention of urine complicated with distension of the bladder. Micturition only took place by overflow. The patient had never had gonorrhoea nor a trauma-

tism of any sort. The disease commenced a year previously by disturbances in micturition, which little by little increased in intensity and soon the patient could only urinate in a squatting position with considerable straining. When he entered the hospital a large tumefaction was present in the perineal region and the vesical globe extended up to the umbilicus. By the catheter 800 cc. urine was withdrawn. After the organ had been emptied the patient complained of pain, which, for that matter, occurs in all instances when a distended bladder contracts and is completely emptied. Palpation combined with rectal examination showed a diffuse tumefaction extending around the prostate, projecting upwards in the direction of the iliac fossa. The tumor appeared to be fluctuating, but an exploratory puncture only resulted in the withdrawal of some serum and blood. After the patient had been in the hospital a few days the tumor had made evident progress and extended higher up in the iliac fossa.

In discussing the treatment Guyon said that a few years previously another patient, somewhat older than the present subject, presented a completely similar lesion in the prostate, but it did not project into the perineum, nor did it extend upwards towards the iliac fossa. The entire prostatic urethra was surrounded by a large and soft tumor, which was also believed to be a sarcoma, but Prof. Fournier, who saw the patient, found signs of hereditary syphilis and believing that the lesion was a specific one prescribed mercurial treatment. Greatly to the surprise of everybody the patient was completely cured and he has remained well ever since.

On account of this successful case, it was decided in the present instance to employ injections of mercury benzoate and afterwards gray oil was tried. A slight improvement appeared to take place at first, but very soon the disease took on its fatal progress and the young patient died from urinary and malignant cachexia.

The autopsy showed an enormous dilatation of the ureters and renal suppuration. The bladder contained pus and its walls were covered with false membrane. Mucous granulations covered the wall. The tumor in the pelvis had taken on a sudden expansion on account of a series of hemorrhages which had arisen in its parenchyma. The entire prostatic portion was surrounded

by a collar-like neoplastic formation; the prostatic urethra had become elongated and its lumen increased.

The symptomatology of sarcoma of the prostate is ordinarily that met with in the case just related, but it is to be pointed out that, after the fiftieth year of life, the vesical symptoms are less accentuated and it is more frequently in the rectal region that the symptoms are observed. In 5 out of 7 cases there was obstinate constipation and only two of the patients presented lesions of partial retention.

When in presence of similar cases one should not hesitate to prescribe massive mercurial treatment and perhaps one will have the good fortune to hit upon a case of hereditary syphilis, such as the one mentioned. For that matter, even if the case is not one of a specific nature, the treatment will do no harm, which is still another reason for resorting to it in doubtful cases.

ABSTRACT DEPARTMENT

"Concerning Early Operation in Renal Tuberculosis."—H. KUMMELL. (*Arch. f. klin. Chir.*, vol. 74, No. 1.)

In a most instructive and valuable article, based upon his experiences and results in forty-eight cases (thirty-three females, fifteen males), Kümmell has reached the following conclusions:

The source of the renal infection was, in most of the cases, a primary tuberculosis focus at some other part of the body, most frequently in the lungs, or in a previous tuberculous adenitis.

That in tuberculosis of the urinary system, the kidney is the primary seat of the tuberculosis disease, from which the infection of the ureters and bladder gradually develops.

That, in bilateral renal tuberculosis, it seems improbable that the second kidney becomes infected by way of an ascending infection from the bladder; but that in his cases, rather, a simultaneous infection of both kidneys occurred, the severity of the disease on the one side forcing the other side into the background.

Vesical tuberculosis, when present, is best treated by the removal of the diseased kidney, presupposing that the other is capable of functioning.

The vesical tuberculosis, as the secondary disease, should never be treated by operation; but, on the other hand, the cause thereof, the diseased kidney, should be removed at the earliest possible moment.

According to his experience, every vesical catarrh (particularly in the female), which is not due to gonorrhoeal infection, or to infection from without, as by catheterization, is suspicious of tuberculosis, and repeated, searching examination for the bacilli, as well as the application of our modern methods of examination, is necessary.

The sooner the diagnosis is made, and the sooner the kidney, which is in the early stages of the disease, is removed, the more certain is the direct result of the

operation at this stage, when the general condition of the patient is still good, and the more promising the outlook for a lasting cure.

In the diagnosis of the disease, in the early stage, the cystoscope leaves us in the lurch, and ureter-catheterization alone assures us the desired diagnosis.

There is no form of kidney disease in which catheterization of the ureters is so necessary to a certain diagnosis, as in tuberculosis.

In general, tuberculosis of the kidney is a more or less rapidly progressive, destructive process, which extends to the renal pelvis, the ureter and the bladder, causes, here, ulcerations which constantly extend, and to the patient great suffering, lengthy invalidism, and, finally, ends in death.

The most rational therapy, and one that promises the longest duration of cure, is nephrectomy, in the removal of the diseased kidney in the earliest possible stage.

The article is a mine of valuable information, and should be read in the original, as it is impossible to do it justice in a short abstract.

"The Importance of Roentgenographie in Surgery."—KUMMELL. (*Zeitschr. f. Aertztliche Fortbildung*, No. 9, 1905.)

In the course of this article Kümmell takes up the value of the X-ray in the surgery of the urinary organs, particularly in the detection of vesical and renal calculi.

Regarding the latter, he is of the opinion that every renal calculus becomes visible upon a good plate, and that, vice versa, if a shadow is wanting, no concretion is present.

"An Air Cystoscope Without an Optical Apparatus, With Inverted Lamp at the Upper Part."—CATHELIN. (*Tribune médicale*, May 27, 1905.)

The cystoscope, which is without prism and lenses, has an eye-piece at the outer end as its only optical part. The lamp in the tip of the beak of the instrument *inside* the sheath, and throws its light downward. The lower, posterior surface of the curved beak of the instrument is wanting, thus forming the window through which the bladder-wall is seen. A flexible mandrin fills out the shaft and beak during the insertion of the instrument. This is then removed, the eye-piece is affixed, and the bladder filled with air.

"A New Method to Aid in the Diagnosis and Treatment of Gonorrhoea."

—ALEXANDER. (*Centralbl. f. d. Krank. h. d. Harn. u. Sexual, Org.*, April, 1905.)

By the injection of a solution of hydrogen peroxide, Alexander claims it to be possible to demonstrate the presence of gonococci, even where the usual provocative tests fail. The strength of the solution employed must vary in proportion to the duration of the process and the amount of urethral secretion, the quantity according to the capacity of the urethra. The procedure is that a quantity of a one per cent. solution of H_2O_2 is injected—just enough fluid until the patient experiences a slight distension,—and allowed to remain in the urethra for one minute, less if the gas-formation in the urethra is very active. The first part of the escaping foam is not used; rather the latter, and the expelled shreds. The secretion to be examined is then placed upon a clean slide, dried, and stained as usual.

According to Alexander, it is possible, by this method, to bring about a dislodgment of the gonococci from their hiding-places, without injury to or irritation of the membrane. He prefers Merck's "Perhydrol," which contains thirty per cent. of H_2O_2 , adding twenty-nine parts of water to one of Perhydrol to prepare the one per cent. solution.